1. EXECUTIVE SUMMARY

This report summarizes state and utility low-income weatherization program activity for households weatherized to completion during calendar year 2003. The report includes state, utility, and agency summaries of calendar year 2003 spending and impacts by measure, end-use, and fuel. The base data consisted of statewide program tracking databases of spending and measure installations for households completed during the calendar year 2003.

We estimated energy and coincident demand impacts for the program participants by adjustment factors to the engineering estimates that were developed for the 1992 program[1]. The gas and electric adjustment factors were derived from a series of fuel consumption analyses, including the 1992 and 1994 program participants. Gas adjustment factors were extended based upon fuel consumption analyses for completions during the period April, 1996 through March, 1997, September, 1998 through August, 1999, January through December, 2000 and 2001, August 2001 to August 2002, and September 2002 to September 2003. Refrigeration measure impacts were adjusted using the results of an electric fuel consumption analysis of January 2002 to January 2003 weatherization clients.

Utilities began funding incremental benefits for increasing the efficiency water heaters replaced for health and safety reasons. We assessed incremental savings for their expenditures. In addition, we developed estimates of savings that reflect the higher heating efficiency of new units that are free of scale buildup within the tank.

The impacts also reflect a revision of the diversified demand factors for electricity measures. The original factors were developed in 1992. The revised values reflect changes in system load factors due to mergers of utilities over the past decade.

Program Costs and Impacts

The WAP program installed measures in 1,824 households during calendar year 2003: measures with direct energy savings were installed in all but five of these. Program expenditures for labor, materials, and support decreased by 8% compared to expenditures during 2002, totaling $9.24 million in calendar year 2003. The average expenditure was $5,064 per household compared with $4,795 the previous year.

The measures installed by the program in 2003 are essentially unchanged from the 2002 program with two exceptions: capyslite bulbs are no longer being installed (compact fluorescent bulb installation rates increased as a result) and no water heater temperature reductions were performed. Notably, the installation frequency for high-efficiency heating replacement units (25%) now exceeds the rate for standard efficiency units (19%) for the first time in the history of the WAP program

The decrease in total funding (8%) combined with the increase in average expenditures (5%) resulted in 13% fewer households served, and reduced savings overall. First-year savings of natural gas totaled 437,603 therms -- a 14% decrease from 511,218 therms in CY 2002. First-year savings of electricity decreased by 22%, to 1,869,400 kWh from the 2,400,162 kWh in the CY 2002 program. About half of the decrease in electricity savings is attributable to downward adjustments of the refrigeration measure

[1] see the following Wisconsin Energy Conservation Corporation reports for a full description of the estimation routines and derivation of the adjustment factors:

- Estimated Low-Income Program Impacts in Iowa, June 14, 1993;
- An Evaluation of Iowa's Low-Income Weatherization Efforts, August 8, 1994; and
- An Evaluation of the 1995 Iowa Low-Income Collaborative Weatherization Program, November 5, 1996.

impacts. The installation rate for refrigeration measures continued to increase: 44% of households received refrigeration measures in the CY 2003 program compared to 36% of households in the previous year. Utility-funded measures were responsible for a higher percentage of energy and demand savings: 43% of all energy and demand savings for electricity (35% in CY 2002), and 41% of natural gas savings (37% in CY 2002).

In addition to utility-provided fuels, the CY 2003 program saved 59,678 gallons of propane. Fuel oil savings totaled 3,559 gallons in CY 2003.

First-year client energy cost savings totaled $455,102. The average savings was $250 per household, increasing slightly from $247 per household in CY 2002.

On average, the program saved 1,031 kWh of electricity for 1,813 households with electricity impacts – this is an 11% decrease in the average electricity savings for households with electricity impacts. The program saved an average of 276 therms of natural gas for 1,814 households with gas impacts (essentially unchanged from CY 2002), 278 gallons of propane in 215 households with propane impacts, and 142 gallons of fuel oil in 25 households with fuel oil impacts.

Utilities contributed $2.21 million in expenditures, or 24% percent of the total program expenditures. Utility-funded measures were installed in 1,214 households. Savings from utility-funded measures averaged 668 kWh in 1,196 utility-funded households with electricity impacts, and 173 therms in 1,037 utility-funded households with gas impacts (both values are essentially unchanged from CY 2002). Utility-funded measures yielded first-year client cost savings or $169,191, averaging $139 per household overall. Electricity savings averaged $52 per household for utility-funded electricity measures, and $103 for those receiving gas measures.

Fuel Consumption Analysis Results

The natural gas savings reported herein have been adjusted at the agency level. The adjustment factors were derived from a fuel consumption analysis of recent program participants. The factors were applied to the estimated natural gas, propane, and fuel oil heating measures, and to natural gas and propane water heater measures. Along with providing better assessments of agency-level impacts, this procedure also provides a check on the accuracy of the algorithms used to estimate savings. The fuel consumption analysis showed 23.0% savings ± 1.0% at 90% confidence for natural gas measures installed in CY 2003.

A fuel consumption analysis was conducted to assess savings for refrigeration measures for the CY 2002 program participants. Observed savings were approximately 64% of those determined in the pilot program evaluation. Measure-specific realization rates were developed for refrigerator exchanges, freezer exchanges, and removed appliances. Refrigerator and freezer exchanges averaged 869 kWh and 662 kWh, respectively after the adjustments. Appliance removals averaged 1,022 kWh and 713 kWh for refrigerator and freezer removals, respectively after the adjustments.

Changes in Reporting

The content of the report and data sources are similar to previous years, with the exceptions that refrigeration measures savings were adjusted based upon results of the electricity fuel consumption analysis.